

PG2.Cv02b

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Chapter 1

Namespace Index

1.1 Packages

Here are the packages with brief descriptions (if available):

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PG2.Cv02	7
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PG2.Lighting	7
PG2.Mathematics	8
PG2.Modeling	8
PG2.Rendering	8
PG2.Shading	8

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Form	
PG2.Cv02.Form1	9
PG2.Lighting.Light	9
PG2.Lighting.PointLight	10
PG2.Mathematics.Vector3	10
PG2.Modeling.Model	12
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PG2.Modeling.World	14
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PG2.Rendering.Ray	16
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Chapter 3

Class Index

3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

PG2.Cv02.Form1	9
PG2.Lighting.Light	9
PG2.Lighting.PointLight	10
PG2.Mathematics.Vector3	10
PG2.Modeling.Block	11
PG2.Modeling.Circle	12
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PG2.Rendering.Ray	16
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PG2.Shading.Shader	17

Chapter 4

Namespace Documentation

4.1 Package PG2

Namespaces

- package [Cv02](#)
- package [Lighting](#)
- package [Mathematics](#)
- package [Modeling](#)
- package [Rendering](#)
- package [Shading](#)

4.2 Package PG2.Cv02

Namespaces

- package [Properties](#)

Classes

- class [Form1](#)
- class **Program**

4.3 Package PG2.Cv02.Properties

Classes

- class **Resources**
A strongly-typed resource class, for looking up localized strings, etc.
- class **Settings**

4.4 Package PG2.Lighting

Classes

- class [Light](#)

- class [PointLight](#)

4.5 Package PG2.Mathematics

Classes

- class **MathEx**
- struct [Vector3](#)

4.6 Package PG2.Modeling

Classes

- class [Block](#)
- class [Circle](#)
- class [Model](#)
- class [Plane](#)
- class [Sphere](#)
- class [Triangle](#)
- class [World](#)

4.7 Package PG2.Rendering

Classes

- class [Camera](#)
- class [Ray](#)

4.8 Package PG2.Shading

Classes

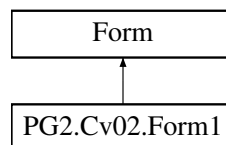
- class [Phong](#)
- class [Shader](#)

Chapter 5

Class Documentation

5.1 PG2.Cv02.Form1 Class Reference

Inheritance diagram for PG2.Cv02.Form1:



Public Member Functions

- void **InitSceneAndLights** ()

Protected Member Functions

- override void **OnPaint** (PaintEventArgs e)
- override void **Dispose** (bool disposing)
Clean up any resources being used.

5.1.1 Member Function Documentation

5.1.1.1 override void PG2.Cv02.Form1.Dispose (bool *disposing*) [protected]

Clean up any resources being used.

Parameters

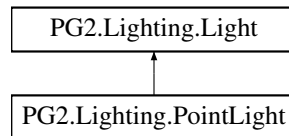
<i>disposing</i>	true if managed resources should be disposed; otherwise, false.
------------------	---

The documentation for this class was generated from the following files:

- Form1.cs
- Form1.Designer.cs

5.2 PG2.Lighting.Light Class Reference

Inheritance diagram for PG2.Lighting.Light:



Public Member Functions

- virtual void **SetLightRayAt** ([Vector3](#) point, [Ray](#) ray)

Public Attributes

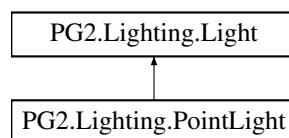
- [Vector3](#) **Origin**
- Double **Intensity**
- [Vector3](#) **DiffuseColor** = new [Vector3](#)(1, 1, 1)

The documentation for this class was generated from the following file:

- Lighting/Light.cs

5.3 PG2.Lighting.PointLight Class Reference

Inheritance diagram for PG2.Lighting.PointLight:



Public Member Functions

- override void **SetLightRayAt** ([Vector3](#) point, [Ray](#) ray)

Additional Inherited Members

The documentation for this class was generated from the following file:

- Lighting/PointLight.cs

5.4 PG2.Mathematics.Vector3 Struct Reference

Public Member Functions

- Vector3** (Double x, Double y, Double z)
- override String **ToString** ()

Static Public Member Functions

- static **Vector3 operator-** (**Vector3** a)
- static **Vector3 operator+** (**Vector3** a, **Vector3** b)
- static **Vector3 operator-** (**Vector3** a, **Vector3** b)
- static **Vector3 operator*** (**Vector3** a, Double b)
- static **Vector3 operator*** (Double a, **Vector3** b)
- static Double **operator*** (**Vector3** a, **Vector3** b)
- static **Vector3 operator%** (**Vector3** a, **Vector3** b)
- static **Vector3 operator^** (**Vector3** a, **Vector3** b)
- static **Vector3 Clamp** (**Vector3** v, Double min, Double max)

Public Attributes

- Double **X**
- Double **Y**
- Double **Z**

Properties

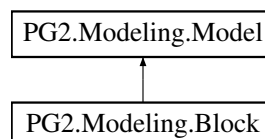
- Double **Length** [get]
- **Vector3 Normalized** [get]
- static **Vector3 Zero** [get]

The documentation for this struct was generated from the following file:

- Mathematics/Vector3.cs

5.5 PG2.Modeling.Block Class Reference

Inheritance diagram for PG2.Modeling.Block:



Public Member Functions

- **Block** (**Shader** shader, **Vector3** min, **Vector3** max)
- override void **Collide** (**Ray** ray)

Static Public Member Functions

- static void **Collide** (**Ray** ray, **Block** box)

Public Attributes

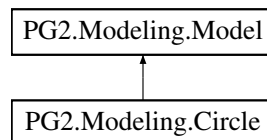
- [Vector3](#) **Min**
- [Vector3](#) **Max**

The documentation for this class was generated from the following file:

- Modeling/Block.cs

5.6 PG2.Modeling.Circle Class Reference

Inheritance diagram for PG2.Modeling.Circle:



Public Member Functions

- **Circle** ([Shader](#) shader, [Vector3](#) origin, [Vector3](#) normal, Double radius)
- override void **Collide** ([Ray](#) ray)

Static Public Member Functions

- static void **Collide** ([Ray](#) ray, [Circle](#) circle)

Public Attributes

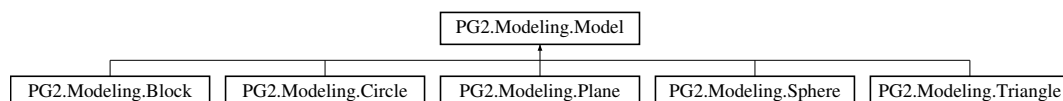
- [Vector3](#) **Origin**
- [Vector3](#) **Normal**
- Double **Radius**

The documentation for this class was generated from the following file:

- Modeling/Circle.cs

5.7 PG2.Modeling.Model Class Reference

Inheritance diagram for PG2.Modeling.Model:



Public Member Functions

- virtual void **Collide** ([Ray](#) ray)

Public Attributes

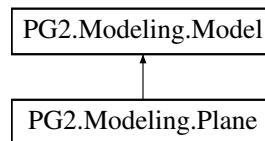
- const double **Eps** = 1e-5
- [Shader](#) **Shader**

The documentation for this class was generated from the following file:

- Modeling/Model.cs

5.8 PG2.Modeling.Plane Class Reference

Inheritance diagram for PG2.Modeling.Plane:



Public Member Functions

- **Plane** ([Shader](#) shader, [Vector3](#) origin, [Vector3](#) normal)
- override void **Collide** ([Ray](#) ray)

Static Public Member Functions

- static void **Collide** ([Ray](#) ray, [Plane](#) plane)

Public Attributes

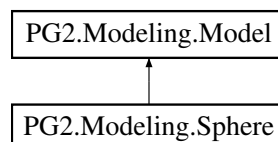
- [Vector3](#) **Origin**
- [Vector3](#) **Normal**

The documentation for this class was generated from the following file:

- Modeling/Plane.cs

5.9 PG2.Modeling.Sphere Class Reference

Inheritance diagram for PG2.Modeling.Sphere:



Public Member Functions

- **Sphere** ([Shader](#) shader, [Vector3](#) origin, Double radius)
- override void **Collide** ([Ray](#) ray)

Static Public Member Functions

- static void **Collide** ([Ray](#) ray, [Sphere](#) sphere)

Public Attributes

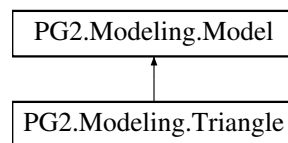
- [Vector3](#) **Origin**
- Double **Radius**

The documentation for this class was generated from the following file:

- Modeling/Sphere.cs

5.10 PG2.Modeling.Triangle Class Reference

Inheritance diagram for PG2.Modeling.Triangle:



Public Member Functions

- **Triangle** ([Shader](#) shader, [Vector3](#) v1, [Vector3](#) v2, [Vector3](#) v3)
- override void **Collide** ([Ray](#) ray)

Static Public Member Functions

- static void **Collide** ([Ray](#) ray, [Triangle](#) triangle)

Public Attributes

- [Vector3](#) **Vertex1**
- [Vector3](#) **Vertex2**
- [Vector3](#) **Vertex3**

The documentation for this class was generated from the following file:

- Modeling/Triangle.cs

5.11 PG2.Modeling.World Class Reference

Public Member Functions

- void **Collide** ([Ray](#) ray)

Public Attributes

- List< [Model](#) > **Models** = new List<[Model](#)>()
- List< [Light](#) > **Lights** = new List<[Light](#)>()

The documentation for this class was generated from the following file:

- Modeling/World.cs

5.12 PG2.Rendering.Camera Class Reference

Classes

- struct [HitPoint](#)

Public Member Functions

- **Camera** (Int32 width, Int32 height)
- [Vector3](#) **GetPixel** (Int32 i, Int32 j)
- void **SetPixel** (Int32 i, Int32 j, [Vector3](#) color)
- void **Render** ()
- void [RayTrace](#) ()

Derived from Computer Graphics - David Mount. Implementations can differ - make your own from scratch. See <http://goo.gl/q6Sz0> (page 84) and <http://goo.gl/rB8J6> (page 9-10)

- [Vector3](#) **RayTrace** ([Ray](#) ray)
- void **PresentFrame** ()

Public Attributes

- [Vector3](#) **Position**
- [Vector3](#) **Target**
- [Vector3](#) **Up** = new [Vector3](#)(0, 0, 1)
- Double **FovY** = 45
- [Vector3](#) **U**
- Bitmap **Bitmap**
- Int32 **Width**
- Int32 **Height**
- [Vector3](#)[] **Pixels**
- [Vector3](#) **BgColor** = new [Vector3](#)(0, 0, 0)
- [World](#) **World**
- Double **zNear**
- Double **zFar**

5.12.1 Member Function Documentation

5.12.1.1 void PG2.Rendering.Camera.RayTrace ()

Derived from Computer Graphics - David Mount. Implementations can differ - make your own from scratch. See <http://goo.gl/q6Sz0> (page 84) and <http://goo.gl/rB8J6> (page 9-10)

The documentation for this class was generated from the following file:

- Rendering/Camera.cs

5.13 PG2.Rendering.Camera.HitPoint Struct Reference

Public Attributes

- [Vector3](#) **Position**
- [Vector3](#) **Color**
- [Vector3](#) **Normal**

The documentation for this struct was generated from the following file:

- Rendering/Camera.cs

5.14 PG2.Rendering.Ray Class Reference

Public Member Functions

- **Ray** ([Vector3](#) origin, [Vector3](#) direction, Double zFar)
- void **Set** ([Vector3](#) origin, [Vector3](#) direction, Double zFar=Double.MaxValue)
- [Vector3](#) **GetHitPoint** ()

Public Attributes

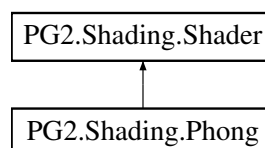
- [Vector3](#) **Origin**
- [Vector3](#) **Direction**
- Double **HitParameter**
- [Vector3](#) **HitNormal**
- [Model](#) **HitModel** = null

The documentation for this class was generated from the following file:

- Rendering/Ray.cs

5.15 PG2.Shading.Phong Class Reference

Inheritance diagram for PG2.Shading.Phong:



Public Member Functions

- **Phong** ([Vector3](#) diffuseColor)
- **Phong** ([Vector3](#) diffuseColor, [Vector3](#) specularColor)
- **Phong** ([Vector3](#) diffuseColor, [Vector3](#) specularColor, [Vector3](#) ambientColor)
- **Phong** ([Vector3](#) diffuseColor, [Vector3](#) specularColor, [Vector3](#) ambientColor, Double shininess)
- override [Vector3](#) **GetColor** ([Vector3](#) point, [Vector3](#) normal, [Vector3](#) viewDir, [Vector3](#) lightDir, [Light](#) light)
- override [Vector3](#) **GetAmbientColor** ([Vector3](#) point)

Public Attributes

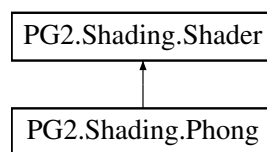
- **Vector3 DiffuseColor** = new **Vector3**(0, 0, 0)
- **Vector3 SpecularColor** = new **Vector3**(0, 0, 0)
- **Vector3 AmbientColor** = new **Vector3**(0, 0, 0)
- Double **Shininess** = 0

The documentation for this class was generated from the following file:

- Shading/Phong.cs

5.16 PG2.Shading.Shader Class Reference

Inheritance diagram for PG2.Shading.Shader:



Public Member Functions

- virtual **Vector3 GetColor** (**Vector3** point, **Vector3** normal, **Vector3** viewDir, **Vector3** lightDir, **Light** light)
- virtual **Vector3 GetAmbientColor** (**Vector3** point)

The documentation for this class was generated from the following file:

- Shading/Shader.cs